

Cap and Trade:

Acid Rain

Program

Basics



Acid deposition, more commonly known as acid rain, occurs when emissions of sulfur dioxide (SO₂) and nitrogen oxides (NO_x) react in the atmosphere (with water, oxygen, and oxidants) to form various acidic compounds. Prevailing winds transport the acidic compounds hundreds of miles, often across state and national borders. These compounds then fall to earth in either a wet form (rain, snow, and fog) or a dry form (gases and particles). Acid deposition has many detrimental impacts on the environment. In response to rising public concern about these impacts, Congress established the Acid Rain Program under Title IV of the 1990 Clean Air Act Amendments.

Capping Emissions Sets Clear Goal

The Acid Rain Program uses a market-based cap and trade mechanism that sets a permanent cap on the total amount of SO₂ that may be emitted by electric power plants nationwide. The first phase of the program began in 1995 and affected a core set of 263 units at 110 mostly coal-burning electric power plants in eastern and Midwestern states. The second phase, which began in 2000, tightened the annual emissions limit imposed on these large, higher emitting plants and also set restrictions on smaller and cleaner plants fired by coal, oil, and gas. The Acid Rain Program affects existing power generating units greater than 25 megawatts and all new units.

Beginning in 2000, SO₂ emissions from these sources were capped at 9.5 million tons (compared to 1980 emissions of 17.3 million tons), and in 2010, the final annual emissions cap is set at 8.95 million tons. Emissions will reach the cap level after the sizeable allowance bank created by early reductions has been drawn down. At full implementation, the cap cuts SO₂ emissions from power plants to one half of the amount of SO₂ emitted in 1980. The cap ensures that the mandated emissions reductions are achieved and maintained over time.

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The Acid Rain Program did not set a cap on NO_x emissions, but instead set emission rate limitations for coal-fired units and allowed companies to develop system-wide compliance strategies with a degree of flexibility. The NO_x program component, also achieved in two phases, requires achievement of a performance standard representing about a 27 percent reduction from 1990 levels.

Allocating Allowances Assigns Responsibility

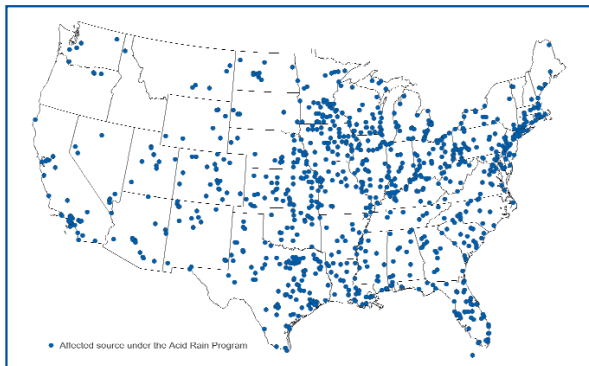
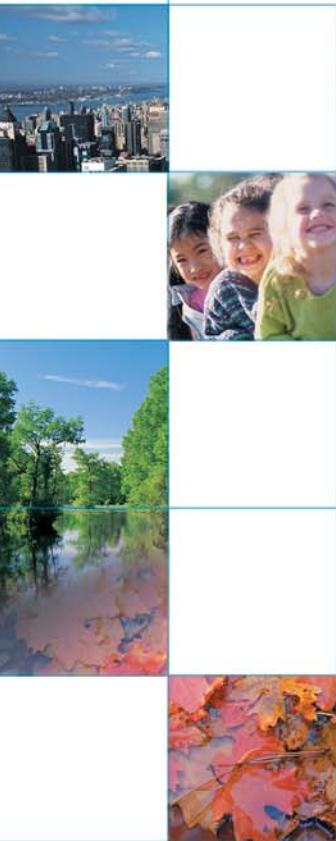
Allowances are the currency used to comply with the SO₂ emission reduction requirements. One allowance provides a regulated unit limited authorization to emit one ton of SO₂. Provisions of the 1990 Clean Air Act describe the allocation of allowances to regulated units based on historic fuel consumption and specific emission rates prior to the start of the program. Some allowances under the cap were set aside in EPA reserves instead of being directly allocated to affected units. For example, some allowances were made available as incentives for units demonstrating SO₂ emissions reductions through energy conservation measures or renewable energy generation prior to compliance requirements.

Each March, nearly three percent of total allowances under the cap are available for purchase from EPA at an auction. Because the availability of allowances was deemed crucial at the program's inception, the auction was instituted to help ensure that all affected units

have a public source of allowances. Moreover, initially the auction ensured an allowance price signal in the market, an important function that facilitates trading. As the program matured, the auction has become a smaller component of total SO₂ allowance market activity. Anyone may purchase allowances in the auction: public interest groups and schools are among past buyers.

Allowance Trading Facilitates Cost Effective Reductions

Allowances are fully marketable commodities that may be bought, sold, or banked (carried over for future use). At the end of each year, every affected unit must hold an amount of allowances at least equal to its annual emissions (i.e., a unit that emits 5,000 tons of SO₂ must hold at least 5,000 allowances usable for that year). Sources that reduce their emissions below the number of allowances they hold may trade these excess allowances with other units in their system, sell them to other electricity generators, or bank them to either cover emissions



Electricity generating emission sources covered by the Acid Rain Program.
Source: www.epa.gov/airmarkets



or sell in future years. Sources with emissions in excess of their allowance holdings must purchase additional allowances for compliance prior to annual reconciliation. It is important to note, however, that regardless of how many allowances a unit holds, it may not emit at levels that would violate any other state or federal requirements.

Under the Acid Rain Program, sources pursued significant early reductions by reducing emissions more than required in the early years of the program, building up a large allowance bank for use in the tighter compliance requirements of the second phase of the program. This may postpone achievement of the cap, but has also delivered earlier human health and environmental benefits than would have otherwise occurred.

Trading under the cap provides flexibility for sources to design their own compliance strategy based on their individual circumstances while still achieving the overall emissions reductions required by the cap. For example, an affected unit's options include installing control equipment, switching to cleaner burning fuel, reassigning some energy production capacity from dirtier units to cleaner ones, implementing conservation or efficiency measures, or buying allowances. Affected units can combine these and other options to tailor their compliance plans to the unique needs of each unit or system. Compliance strategies require no special prior approval, allowing sources to respond quickly to market conditions.

Monitoring and Reporting Ensure Complete Accountability

Emissions monitoring and reporting systems are critical components of a successful program. Since the Program's inception in 1995, the emissions data – continuously monitored by sources, verified and recorded by EPA, and posted for public review on the Internet – has been among the most complete and accurate ever collected by EPA. Unlike traditional emissions limitation programs, the Acid Rain Program requires an accounting of each ton of emissions from each regulated unit to determine compliance. The Acid Rain Program requires units to install Continuous Emissions Monitoring Systems (CEMS) to continuously measure and record emissions. In order to ensure accurate emissions monitoring and reporting, regulations specify equipment certification procedures, periodic quality assurance and quality control procedures, record keeping and reporting, and procedures for filling in missing data periods. All affected units are required to report hourly emissions on a quarterly basis to EPA's tracking system. EPA invests substantial time and resources into assuring that both the monitoring and reporting of emissions are occurring properly and efficiently. Conservative "missing data" procedures help ensure that emissions are never understated. Real-time electronic auditing by EPA helps to ensure that emissions data are accurate, consistent, and complete. For more information, visit www.epa.gov/airmarkets/emissions/index.html

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Tracking Emissions and Allowances

EPA administers electronic tracking systems to provide complete accounting of emissions and allowances under the Acid Rain Program. These systems allow EPA to ensure timely reporting of

emissions data, check data accuracy, and conduct annual reconciliation of reported emissions with each unit's allowance holdings. The tracking systems have been continually upgraded to perform hundreds of data quality checks, and to provide easy access to emissions data for every unit covered by the program. Emissions data are available on the Clean Air Markets Division (CAMD) Web site at <http://cfpub.epa.gov/gdm/>

EPA tracks the issuance of all allowances, the number of allowances each account holds, the transfer of allowances between accounts, and the deduction of allowances for compliance purposes. To facilitate tracking and recording, EPA assigns every account an identification number and every allowance a serial number. Any person or group, including brokers, investors, and interested citizens wishing to purchase allowances may open a general account in the system. Allowance transfers may be completed online using the CAMD Business System. Allowance information is available at www.epa.gov/airmarkets/tracking/index.html

Continuous Monitoring Accounts for Every Ton of Emissions



In-stack emission monitors

On-site Continuous Emissions Monitoring Systems (CEMS) analyzers

Sophisticated electronic monitoring systems continuously monitor emissions and report data to EPA.

Annual Reconciliation for Compliance

Annual reconciliation refers to EPA's task of reconciling the annual emissions of a unit with its allowance holdings. At the end of each year, each affected unit is granted a 60-day grace period, during which SO₂ allowances may be purchased, if necessary, to cover each unit's emissions for the previous year. At the end of the grace period, the allowances a unit holds in its compliance account must equal or exceed the annual SO₂ emissions recorded by the unit's monitoring system and verified by EPA. Any remaining allowances may be sold or banked for use in future years. If annual emissions exceed the number of allowances held, the owners or operators of delinquent units must pay a penalty (\$2,000 in 1990 dollars, adjusted each year for inflation, e.g. \$2,900 for 2003) per excess ton of SO₂ emissions. In addition, violating sources must offset the excess SO₂ emissions by surrendering future year allowances in an amount equivalent to the excess.